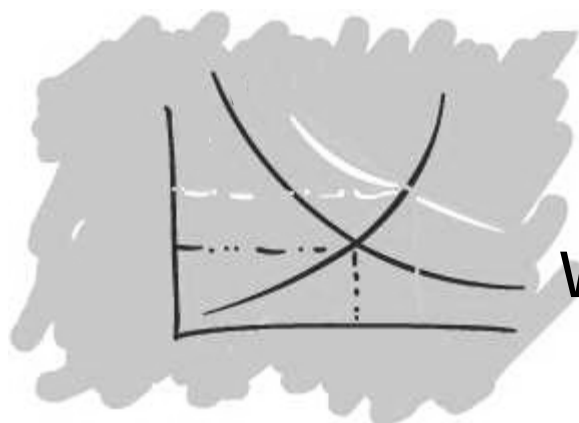


I.S.S.N: 1885-6888



ECONOMIC ANALYSIS WORKING PAPER SERIES

Minimum Wage and Youth Employment Rates in Spain:
New Evidence for the Period 2000-2008

♦

Maite Blázquez, Raquel Llorente and Julián Moral

Working Paper 2/2009



DEPARTAMENTO DE ANÁLISIS ECONÓMICO:
TEORÍA ECONÓMICA E HISTORIA ECONÓMICA

Minimum Wage and Youth Employment Rates in Spain: New Evidence for the Period 2000-2008

Maite Blázquez ¹, Raquel Llorente y Julián Moral
(*Universidad Autónoma de Madrid*)

Abstract

The existence of a universal minimum wage has been, and continues to be, an intensely debated issue. On the one hand, the controversy surrounding minimum wage appears to be partly justified because the effects of the introduction and increase of minimum wage may differ greatly depending on the labour market structure. On the other, the current academic literature on the subject do not provide clear evidence of which collectives are likely to be more affected in terms of employment by the introduction or increase of minimum wage. Using the data for the period 2000-2008, this study aims to examine the effect of minimum wage on the youth employment in Spain, taking into account both the existing regional differences and the dynamic behaviour of employment. Unlike other previous academic works on this subject, we are also going to consider the effect of seasonality on employment, a particularly wide-spread feature of youth employment in Spain. The results obtained in our analysis do not provide clear evidence about any negative effect of minimum wage on youth employment during the period under study. While this result may point out to the existence of a monopsonistic structure of the labour market, the coexistence of increases both in minimum wage and in youth employment rate during this period could also be explained in the light of a perfect competitive labour market with a high degree of dynamism and a structural change in employment demand.

JEL Classification: J21, J31, J18

Key Words: Employment rate, minimum wage, Kaitz index.

¹ Corresponding author: Maite Blázquez, Dpto. Análisis Económico: Teoría Económica e Historia Económica (Universidad Autónoma de Madrid). Cantoblanco (28049). Madrid. Tel: +34 914972974. E-mail: maite.blazquez@uam.es

1. Introduction.

Today over hundred countries from across the globe have ratified the International Labour Organisation's Minimum Wage Fixing Convention, 1970 (No. 131)² for the introduction of appropriate legislation and administrative regulations regarding minimum wage. As signatories of this convention, these countries now provide universal minimum wage coverage, with only few of them applying certain restrictions on this respect³.

The existence of minimum wage providing universal coverage has been a widely contested issue. On the one hand, those who advocate for its introduction or maintenance argue that a minimum wage established by law provides a basic guarantee for self-sufficiency, that is to say, a sufficient income for full-time workers to acquire essential goods and services. Likewise, the existence of a minimum wage, it is argued, prevents those employers who hold a dominant market position to take advantage of certain type of employees like women, low-qualification workers, long-term unemployed, and individuals with little or no working experience, etc.

On the other hand, those who oppose the existence of a minimum wage, or its maintenance at the current high levels, for its presumed negative effects have advanced several arguments for its dismissal. They argue, for example, that a minimum wage is not a suitable instrument to fight poverty since there are other more effective and efficient fiscal alternatives. For them, the existence of a minimum wage discourage employers from hiring persons covered by the current legislative and, therefore, affects

² International Labour Organisation (ILO) (2008).

³ Among the countries which do not include certain workers' collectives in their respective minimum wage legislation we can mention the following examples: agricultural workers in Canada; agricultural workers, domestic services workers and public servants in Austria; workers who are relatives to the owner or legal representative of the business in Ireland; apprentices and domestic workers in Holland, workers who are not covered by collective bargain agreements in Switzerland, workers who are family members of the owner or legal representatives of the business, fishermen and members of the professional armed forces in UK; retail, health and education workers and individuals employed by public agencies in the USA.

negatively on the overall employment rate of certain collectives, especially women and young people. In addition to this, they also like to point out to other presumed negative effects which minimum wage might have like. For example, on the competitive position of businesses and companies, the compensatory replacement between workers, the increase of the differences between the so-called insiders and outsiders, or the indirect stimulus it provides for the growth of an informal economy.

To some extent, this controversy appears to be justified because the effects which result from the introduction or increase of minimum wage differ from one country to another, depending both on the content and application of the approved legislation and the particular structure of the labour market. In a perfect competitive labour market, the introduction of a minimum wage would tend to reduce unemployment. But, in a monopsony structure of the labour market, the effect might well be the opposite.

These conflicting assessments on the effects of minimum wage are clearly revealed in many of the empirical studies devoted to the subject. Most pioneering works were primarily focused on the economy of the United States and based on a competitive structure of the labour market. They concluded that the existence of minimum wage had a negative effect on youth employment (Hashimoto and Mincer, 1970; Welch, 1974; Hamermesh 1981; Brown et al., 1982; Wellington, 1991; Neumark and Wascher, 1992; Deere et al., 1995; Currie and Fallick, 1996; Partridge and Partridge, 1998; Williams and Mills, 1998; Baker et al., 1999; Pereira, 2003; Yuen, 2003; Neumark et al., 2004). Assuming the existence of a monopsony structure, other studies have provided, in contrast, evidence for the neutral, or even positive, effects of minimum wage on youth employment (Card and Krueger, 1995; Manning and Machin, 1996; Dickens et al., 1998, 1999; Bhaskar, 1999; Lang and Kahn, 1999). Other works based on the current efficiency wage literature have also reached similar conclusions in this respect (Rebitzer and Taylor, 1995).

Using the panel data for the period 2000-2008, this study analyses the impact of minimum wage on youth employment in Spain, taking into account both the existing

regional differences and the dynamic behaviour of employment. We also include in our analysis labour seasonality, a relatively widespread feature of youth employment in Spain. The results obtained do not provide sufficient evidence of any negative effect of minimum wage on youth employment in Spain over the period under study. While this result may appear to indicate the existence of a monopsony structure in the labour market, the coexistence of an increase in both minimum wage and youth employment during this period could also be explained in the light of a perfect competitive labour market with a strong dynamism and a structural change in labour demand.

The paper is organized as follows: the next section will provide a summary review of the recent literature on the subject. In section 3 we introduce the theoretical framework for the development of the empirical analysis. Section 4 offers a description of the data and the main variables employed in our analysis. In Section 5, we present the results obtained of our analysis, while Section 6 examines the possible effects of an increase of the minimum wage on different proposed scenarios. The main conclusions are offered in Section 7.

2. Empirical Evidence

In general terms, the results obtained by the analytical works carried out for the last few decades in developed countries to measure the impact of minimum wage on the aggregated employment and unemployment tend to show negative elasticities in the estimated employment functions⁴. This appears to be particularly the case when the minimum wage has been significantly increased or it has been initially established at a relatively high level. In addition to this, as we move forward in time from the introduction of this measure, the negative value of the elasticity grows in absolute terms, a fact which appears to indicate –as it happened before with the case of labour demand relative to wage- the existence of lags on its influence, that is to say, of accumulated effects.

⁴ C. Brow, C. Gilroy and A. Cohen (1982) review the academic research on the subject up the 1980s. For other, more recent academic works see OCDE (1994).

The importance of the effect on employment clearly differs based on the weight of minimum wage in relation to the average market wage. Evidence shows that if the minimum wage is high, the effects are negative, while if it is low, the effects are not significant (Katz and Krueger, 1992). From another point of view, for adult workers whose previous market wages were below the new minimum wage, the introduction of minimum wage has negative consequences on their employment as the unemployment rate grows among them over time, as it is demonstrated on a series of studies carried out in different countries (Linneman, 1980)

In the pioneering works on this subject, which were primarily focused on the low-wage productive sector (agriculture, retail trade, personal services, and certain manufacturing activities), the estimates show a 1 percent fall on employment levels for a 10 percent minimum wage increase (Brown et al., 1982). According to more recent estimates, the unemployment effects are concentrated on those individuals whose wages are further below from established minimum wage as well as those whose wages are just below the minimum wage, with elasticity values clearly significant, not only for the youth but also for adults who occupy the lower positions of the wage scale (Neumark et al., 2004). This reported evidence primarily applies to wage adjustment, working hours, employment and income distribution derived from minimum wage increases.

For Spain, the results do not differ greatly from the evidence obtained in other developed countries. The most relevant result at domestic level is that employment among younger people responds in a negative and significant way to changes on minimum wages (Pérez Domínguez, 1995; Dolado et al., 1996, Dolado y Felgueroso, 1997; González y Güemes, 1997; Dolado et al., 1999; Pérez Domínguez et al., 2002). However, this result does not appear to be so conclusive when we adjust the differential effect of minimum wage for the different regions. In this respect, although minimum wage legislation provides universal coverage in Spain, there are enough regional differences in the social and labour structures to make possible the existence of a different effects on minimum wage on youth employment in each of them. Following

this premise, González Güemes et al. (2003) have found evidence that the elasticity of youth employment to changes in minimum wages differs greatly in each region.

Other contributions in the case of Spain have found that minimum wage has simultaneous effects on employment, labour participation, and unemployment rate of the younger sections of the population, pointing out to the existence of a series of negative effects which tend reinforce the unemployment among this age group (Pérez Domínguez et al, 2002).

Apart from these regional differences and their significance when examining the impact of minimum wage on youth employment, more recent works on the subject have indicated the existence of a dynamic behaviour of employment as a response to changes in minimum wage (Neumark and Washer, 1992; Baker et al., 1999). The work of González Güelmes et al. (2003) have provided important evidence concerning of these dynamic effects in the Spanish economy.

3. Theoretical Framework and Econometric models.

The relevance of the effect of minimum wage on employment clearly varies according the weight of the minimum wage relative to the average wage. As previous works have shown, the impact of minimum wage will be greater on a given wage distribution, the closer it is to the average wage. Evidence shows that when it is high, its impact is negative, while if it is low, the consequences of its introduction are negligible⁵. For this reason, the most common approach for examining the effects of the introduction and increase of minimum wage on employment on a territorial basis is to use the Kaitz Index (KI) which is defined as the ratio of the minimum wage to the average wage. An important reason for employing this index is that it makes possible to collect the non-observable labour supply and demand factors, because its denominator – the average wage- can be affected either by supply or demand shocks.

⁵ L. F. Katz and A. B. Krueger (1992)

As most academic works in the subject made clear, young people between 16 and 19 years of age usually have the lowest wages and, as a result, tend to be one of the most examined collectives in the empirical works aimed to study the impact of minimum wage on employment. The following equation of youth employment is commonly used as the starting point for any theoretical framework aimed to analyse the impact of minimum wage on employment.

$$e_{it} = f(KI_{it}, X_{it}) \quad (0)$$

where the sub-indexes i and t represent, respectively, the region and period under study; e the youth employment rate; KI the Kaitz index; and X captures a number of variables which affect both labour supply and demand.

It is important to note that, although the minimum wage in Spain is established at national level, there are reasons to think that this may be different for each autonomous regions (Comunidades Autónomas, henceforth CCAA). For example, as previous studies have pointed out (González Güemes et al., 2003) ,the number of effective hours worked may show certain variations between each region as well as over time. If that is the case, a Kaitz Index conceived as a simple quotient of the minimum wage and the average wage will not capture these differences. For this reason, the KI employed here has been elaborated as the ratio of the minimum wage per worked hour for full-time workers in a region to the average wage per worked hour in that particular region:

$$KI = W_{\min} / W_{\text{med}} \quad (1)$$

where W_{\min} is the minimum wage per worked hour for full time workers and W_{med} the average wage per worked hour.

Furthermore, if there are differences in the sectoral distribution of youth employment by regions, the KI defined in equation (1) ill not capture these differences.

To prevent the results to be biased due to these differences, we have accordingly proposed this alternative formulation, where KI is expressed in the following way:

$$KI_1 = \sum_i (O_i/O_t) (W_{\min}/W_{med_i}) \quad (2)$$

where O_i represents the persons employed in sector i , O_t the total number of employed persons in the economy, and W_{med_i} the average wage per worked hour in the sector i ⁶. This new formulation allows us to take into account both the economic weight of different sectors in each region and the wage differences between sectors.

Using both definitions of KI, we proceed to estimate a first block of static models and, then, another second block to capture a specific quarterly dynamic. In both blocks, we begin with the estimation of a basic model although, as pointed out in other works (Neumark and Wascher, 1992, 1994; Baker et al., 1999; González Güemes et al, 2003), we need to incorporate lags to the KI because the response of employment to variations of minimum wage may take some time to become noticeable. It is important to incorporate this dynamic because, as we will see below, youth employment can respond in a positive way to current changes in minimum wage but such effect may later on become neutral or even negative. Finally, the models we have estimated incorporate dichotomic quarterly variables because we find a significant seasonal factor on youth employment⁷.

A. Static Models.

I. Basic

$$y_{it} = \alpha + \gamma KI_{it} + \beta X_{it} + \eta_i + \varepsilon_{it} \quad \varepsilon_{it} \square iid; i : CCAA; t : \text{Period} \quad (3)$$

II. With lags in Kaitz Index

$$y_{it} = \alpha + \gamma KI_{it} + \sum_{s=1}^4 \delta_s KI_{it-s} + \beta X_{it} + \eta_i + \varepsilon_{it} \quad \varepsilon_{it} \square iid; i : CCAA; t : \text{Period} \quad (4)$$

⁶ The sub-index i includes three sectors: industry, construction and services.

⁷ We have also tested the non-quarterly employment rate as a dependent variable. The results are similar to those obtained with quarterly dichotomic variables.

III. With lags in Kaitz Index and quarterly dummies

$$y_{it} = \alpha + \gamma KI_{it} + \sum_{s=1}^4 \delta_s KI_{it-s} + \beta X_{it} + \eta_i + \varpi_s + \varepsilon_{it} \quad \varepsilon_{it} \square iid; \quad (5)$$

$i : \text{CCAA}; t : \text{Period}; s : \text{Quarter}$

B. Dynamic Models

I. Basic

$$y_{it} = \alpha + \gamma KI_{it} + \beta X_{it} + \eta_i + \varepsilon_{it} \quad i : \text{CCAA}; t : \text{Period} \quad (6)$$

$$\varepsilon_{it} = \rho \varepsilon_{it-1} + v_{it} \quad v_{it} \square iid$$

II. With lags in Kaitz Index

$$y_{it} = \alpha + \gamma KI_{it} + \sum_{s=1}^4 \delta_s IK_{it-s} + \beta X_{it} + \eta_i + \varepsilon_{it} \quad \varepsilon_{it} \square iid; \quad i : \text{CCAA}; t : \text{Period} \quad (7)$$

$$\varepsilon_{it} = \rho \varepsilon_{it-1} + v_{it} \quad v_{it} \square iid$$

III. With lags in Kaitz Index and quarterly dummies

$$y_{it} = \alpha + \gamma KI_{it} + \sum_{s=1}^4 \delta_s KI_{it-s} + \beta X_{it} + \eta_i + \varpi_s + \varepsilon_{it} \quad \varepsilon_{it} \square iid; \quad (8)$$

$i : \text{CCAA}; t : \text{Period}; s : \text{Quarter}$

$$\varepsilon_{it} = \rho \varepsilon_{it-1} + v_{it} \quad v_{it} \square iid$$

where y_{it} captures the youth employment rate for CCAA and period; KI_{it} the KI for CCAA and period; and X_{it} a set of explanatory variables common to the three estimated models: *Ocup* (total number of employed persons in the region); *Temp* (temporality ratio in the region); *Asalar_no* (percentage of wage earners with no qualifications in the region); *Inmig* (percentage of immigrants in the region). We also have to clarify the following points: *i*) the fixed effects of a CCAA are controlled in all cases⁸; *ii*) the econometric adjustments are made from the series of quarterly data which

⁸ As it has been pointed out by previous works (see, for example, González Güemes et al., (2003)), estimates of the minimum wage effects on youth employment rate which do not control for the CCAA fixed effect yield non-biased results.

includes the period 2000QI-2008QI⁹; *iii*) the functional form adopted for the estimation is logarithmic and, as result, the estimated KI coefficient should be interpreted as the employment elasticity of the examined collective in relation to the variations of that index.

4. Data and Descriptive analysis.

In this section we describe the evolution of the KI and the youth employment rate using the available information. We also offer initial evidence of the existence of regional differences in the evolution of these variables. The data used in our analysis have been collected from different statistical sources. More specifically, the data for the employment rate, as well as all the information used in the explanatory variable vector X_{it} has been taken from the Spanish Labour Force Survey (*EPA*). The data about minimum wage have been collected from the statistics of the Labour and Immigration Ministry¹⁰, while the data for average wages proceeds from the Quarterly Survey of Labour Costs (period 2000-2008) and the Industry and Services Wage Survey (1981-1999), taking as the value for the average wage the value corresponding to the ordinary wage cost. Table 1 shows information about the evolution of the Inter-professional Minimum Wage (SMI) in Spain between 1999 and today, including relevant legislation and the successively established minimum wage levels. Up to the year 1997, the available data only provided information about whether workers were under 18 years of age, 18 years old, or above this age. This is not longer the case with the more recent and current set of data. In the table below, we also show the percentage of nominal increases established by legal dispositions in relation to previous minimum wage levels. These increases were particularly significant in some specific years (1990, 1996, 1997), usually after a period of price increases. For the last three year, the real increases have been above the historic increases¹¹.

⁹ The use of quarterly data offers an additional advantage: it allows to capture the short-term fluctuations of labour demand.

¹⁰ <http://www.mtin.es/estadisticas/bel/IC/index.htm>

¹¹ The Labour and Immigration Ministry's Labour Guide is published annually and provides detailed information about the general and particular application of SMI.

Table 1: Minimum Inter-professional Wage (SIM) evolution by age, amount, and period: 1990-2008*

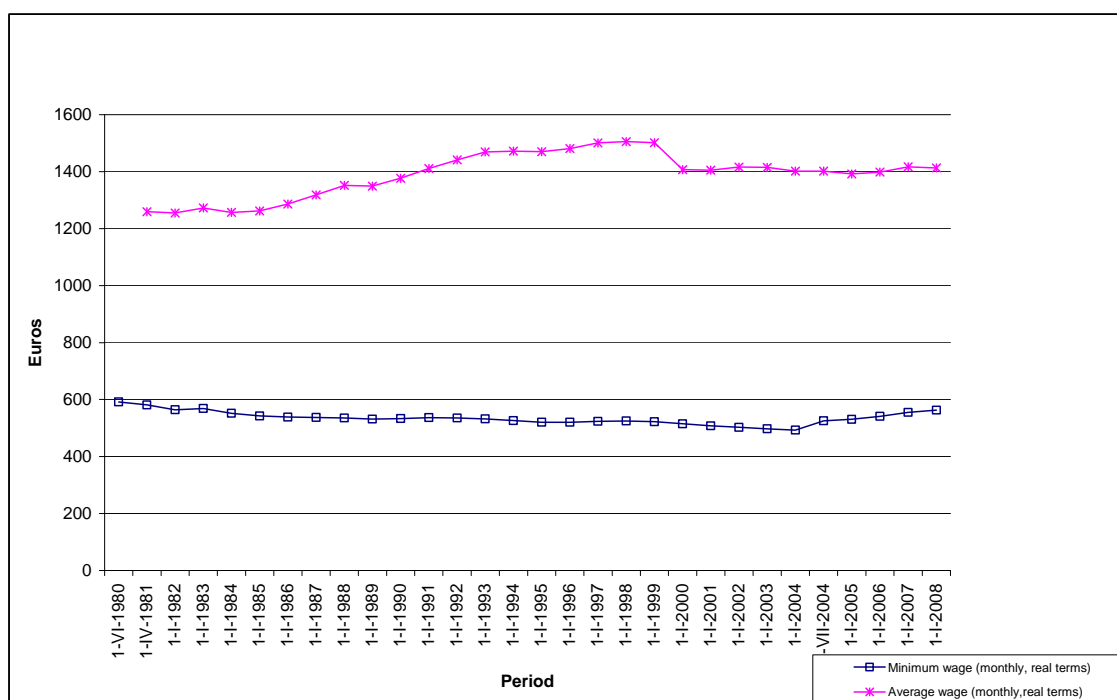
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Under 18 years of age																				
Euros per day	6,6	7	7,4	7,8	8	8,3	10,1	11,8	..	..	..	..	..	..	..	..	..
Euros per month	198,3	211,3	223,4	232,4	240,5	249	301,8	355,4	..	..	..	..	..	..	..	..	..
Increase	15,2	6,5	5,7	4	3,5	3,5	21,2	17,7	..	..	..	..	..	..	..	..	..
18 years of age and older																				
Euros per day	10	10,7	11,3	11,7	12,1	12,6	13	13,4	..	..	..	..	..	..	..	..	..
Euros per month	300,6	320	338,2	351,8	364	376,8	390,2	400,4	..	..	..	..	..	..	..	..	..
Increase	7,1	6,5	5,7	4	3,5	3,5	3,5	2,6	..	..	..	..	..	..	..	..	..
No age distinction																				
Euros per day	..	..	..	..	..	..	..	..	13,6	13,9	14,2	14,4	14,7	15	15,4	17,1	18	19,0	20,0	20,8
Euros per month	..	..	..	..	..	..	..	..	408,9	416,3	424,8	433,4	442,2	451,2	460,5	513	540,9	570,6	600,0	624,0
Increase	..	..	..	..	..	..	..	..	2,1	1,8	2	2	2	2	2	..	5,4	5,4	5,1	4,0

Source: Spanish Labour and Social Affairs Ministry

*Legislation:	1993: R.D. 44/1993 1994: R.D. 2318/1993 1995: R.D. 2458/1994 1996: R.D. 2199/1995 1997: R.D. 2656/1996	1998: R.D. 2015/1997 1999: R.D. 2817/1998 2000: R.D. 2065/1999 2001: R.D. 3476/2000 2002: R.D. 1466/2001	2003: R.D. 1426/2002 2004: R.D. 1793/2003 2005: D.L. 3/2004 2005: R.D.2388/2004 2006: R.D. 1613/2005 2007 R.D. 1632/2006	2008 RD 1763/2007
1990: R.D. 170/1990 1991: R.D. 8/1991 1992: R.D. 3/1991				

Graph 1 shows the evolution of the minimum and the average wage in real terms for the period 1980-2008. Here it is important to note the fall of both minimum and average wages in real terms during the period 1998-2004.

Graph 1: Minimum and Average wage (real terms). Period 1980-2008



As it can be observed in the data of Table 2, there was a general expansion of employment during this period. From 2004-2005, however, there are changes in the evolution of these variables: while Minimum Inter-professional Wage (SMI) increased in real terms, the youth employment rate growth experienced a slowdown.

Table 2: Youth employment rates in Spain (1996-2008)

1. OVERALL EMPLOYMENT RATE	1996	2004	2005	2006	2007	2008 T2
	49,0	62,0	64,3	65,7	66,6	
2. INDEX OF EMPLOYMENT RATE EVOLUTION FOR THE FOLLOWING COLLECTIVES:	2001-04		2005-08			
Youth 16-19	95		94			
Youth 20-24	105		101			
Youth 16-24	104		99			
Group 25-29	104		102			
Group 30-34	104		103			
Group 35-39	103		103			
Group 40-44	103		102			
Group 45-49	105		105			
Group 50-54	106		105			

Source: INE, EPA (Population aged between 16-64 years)

From the data about minimum and average wages, we proceed to estimate the Kaitz Index. The graphs of *Block I* (see Appendix) show the KI evolution by sector and CCAA for the period 2000-2008. In general terms, we observe a slightly growing trend in the evolution of KI for most regions, which indicates that the minimum and the average wages are drawing closer in the CCAA. Furthermore, the graphs also reveal the existence of regional differences in relation to the value of the index. The lower values for the index (below 35%) are found in regions like Catalonia, Madrid, Navarra and Basque Country, while the higher values are registered in Murcia, Galicia and Extremadura (around 45% in this last region). The existence of these differences is particularly relevant for our conclusions: if there is any significant effect (either positive or negative) of minimum wage on youth employment, this is expected to be larger in the regions with a higher KI value.

According to economic sectors, these differences become quite significant as we find different behaviour patterns. In a several CCAA the KI for some industries is clearly below the total KI: this is case in Aragon, Asturias, Cantabria, Canary Islands, Castilla y León, Catalonia, Galicia, Madrid, Navarra and Basque Country. However, there are no significant differences between both indexes in regions like, for example, Andalusia, Balearic Islands, Castilla la Mancha, Valencian Community, Extremadura and Murcia. In other regions, by contrast, it is remarkable that the KI for the construction sector is above the total KI. This is the case of Balearic Islands, Canary Islands, Castilla la Mancha, Castilla y León, Valencian Community, Catalonia, Extremadura, Galicia, Murcia and Madrid. Finally, the KI in the services sector is relatively similar to the total KI in all regions with the exception of Asturias.

Furthermore, the graphs from *Block II* (see Appendix) provide a first approximation about the relationship between KI values and youth employment rate figures. In general terms, the starting point is a youth employment rate located between the 15% and 20% with a slightly growing tendency over time in most regions. Asturias and the Basque Country can be singled out for their relatively low youth employment rates (around 10%), while other CCAA like Castilla la Mancha, Valencian Community and Murcia show relatively higher values (around 25%). Another significant aspect of youth employment is its marked seasonality. In most regions, youth employment rates,

as can be clearly observed, tend to reach their highest levels in the third quarter of the year.

From the previous descriptive analysis, it is difficult to derive any clear pattern relating the KI values to youth employment rates. On the one hand, we find some regions where the values for youth employment rates are –with some differences between them- relatively closer to the KI values like, for example, in the case of the Balearic Islands, Catalonia, Valencian Community, Madrid and Navarra. On the other hand, we also have the case of Catalonia which has a KI of 30-35% over time and a youth employment rate close to the 25%. While Madrid has a similar KI value as Catalonia, the youth employment rates in this region have experienced a substantial growth over the period under study as they have doubled and reached 20% at the end of it. The case of the Balearic Islands is noteworthy for the volatility of youth employment rates, characterised by a marked seasonality. A similar phenomenon can be observed in Navarra, although in this region the employment rates are on average lower than in the Balearic islands, as it is the case with its KI value. Finally, there are regions like Asturias, Canary islands, Cantabria, Extremadura, Galicia and Castilla y León which show larger differences between KI values and youth employment rates.

5. Results.

In this section we report the main results of the estimates obtained from the econometric models introduced in Section 3. Table 3 shows the results for the models of Block A, when the KI definition does not take in to account sectoral differences (equation (1))

As we have previously indicated, it is particularly relevant to introduce lags for a correct analysis of the effect of minimum wage over youth employment. When such lags are not introduced, we find a positive and significant effect of the index over the youth employment rate. However, if we introduce four lags for each quarter of the year, the effect becomes negative but not significant. More specifically, we find positive and significant effects in the first, second and fourth lags, and a negative and significant

effect in the third lag. Finally, when we include quarterly dicothomic variables, we observe a positive and significant effect only in the first lag. To this we have to add the positive and particularly significant effect of the third quarter dummy on youth employment rate, which serves to demonstrate the high degree of seasonality of employment among this particular collective.

Table 3: Block A Econometric Models (Kaitz Index, equation(1))

	<i>Basic</i>		<i>With KI lags</i>		<i>With KI lags and quarterly dummies</i>	
	Coef	t	Coef	t	Coef	t
LogIK	1,065	4,00	-0,551	-1,28	0,447	0,96
LogIK_1			1,810	3,68	1,443	2,51
LogIK_2			2,600	5,16	0,466	0,80
LogIK_3			-2,793	-5,56	-0,507	-0,88
LogIK_4			0,823	1,88	0,392	0,87
Ocup	0,495	3,49	0,271	1,70	0,094	0,64
Temp	0,285	2,33	0,256	2,05	0,322	2,81
Asalar_noc	0,196	2,14	0,259	2,65	0,215	2,40
Inmig	-0,009	-0,61	-0,023	-1,37	-0,018	-1,14
2nd Quarter					0,041	1,53
3rd Quarter					0,210	9,16
4th Quarter					0,037	1,33
Constant	-5,788	-5,53	-7,321	-6,40	-7,597	-7,22
σ_{η}	0,497		0,390		0,379	
σ_{ε}	0,182		0,171		0,156	

Table 4: Block B Econometric Models (Kaitz Index, equation(1))

	<i>Basic</i>		<i>With KI lags</i>		<i>With KI lags and quarterly dummies</i>	
	Coef	t	Coef	t	Coef	t
LogIK	1,099	3,26	-0,313	-0,70	0,462	1,01
LogIK_1			1,396	3,24	1,108	2,36
LogIK_2			2,788	6,21	0,706	1,45
LogIK_3			-2,752	-6,39	-0,638	-1,37
LogIK_4			0,497	1,14	0,312	0,73
Ocup	0,720	3,66	0,476	2,11	0,243	1,13
Temp	0,275	2,00	0,118	0,84	0,217	1,69
Asalar_noc	0,230	2,04	0,392	3,24	0,324	2,91
Inmig	-0,056	-2,60	-0,036	-1,49	-0,014	-0,62
2nd Quarter					0,046	2,14
3rd Quarter					0,206	9,76
4th Quarter					0,040	1,75
Constant	-7,380	-8,09	-7,574	-7,24	-7,492	-8,07
ρ	0,345		0,329		0,366	
σ_{η}	0,676		0,491		0,381	
σ_{ε}	0,172		0,165		0,147	

In Table 4, we show the estimates for the models of Block B. As it can be observed, the results are quite similar to those obtained in Block A: positive and significant KI effects in the Basic Model; positive and significant effects in the first and second lags and negative in the third when we include the variable with four quarterly lags; and positive and significant effect only in the first lag when we also incorporate the quarterly dicothomic variable estimates.

In Tables 5 and 6 we provide the estimates for Blocks A and B, respectively, but this time taking into account the definition of KI introduced in equation (2). In this set of estimates, it is significant to note that both the static and dynamic models show a positive and significant effect in the current value of the index on youth employment rate when we include index lags and quarterly dicothomic variables.

We do not observe, however, any significant effect in the index lags. It is worth noting again that the positive and significant value taken by the dicothomic variable quotient on the third quarter indicates the extent to which job opportunities for young people tend to be primarily concentrated on seasonal employment, closely linked to the services sector.

Table 5: Block A Econometric Models (Kaitz Index, equation(2))

	<i>Basic</i>		<i>UIT KI lags</i>		<i>With KI lags and quarterly dummies</i>	
	Coef	t	Coef	t	Coef	t
LogIK	0,173	2,55	0,000	0,00	0,358	3,13
LogIK_1			0,038	0,27	-0,056	-0,39
LogIK_2			0,671	4,89	0,012	0,08
LogIK_3			-0,398	-2,94	0,074	0,52
LogIK_4			-0,078	-0,75	0,011	0,10
Ocup	0,433	2,45	0,299	1,40	-0,081	-0,41
Temp	0,281	2,27	0,282	2,14	0,298	2,50
Asalar_noc	0,185	1,98	0,164	1,60	0,184	1,99
Inmig	-0,022	-1,36	-0,034	-1,87	-0,037	-2,26
2nd Quarter					0,071	2,91
3rd Quarter					0,245	9,61
4th Quarter					0,046	1,86
Constant	-2,063	-1,93	-1,304	-1,05	0,460	0,40
σ_{η}	0,464		0,381		0,337	

σ_ε	0,184	0,179	0,161
----------------------	-------	-------	-------

Table 6: Block B Econometric Models (Kaitz Index, equation(2))

	<i>Basic</i>		<i>With KI lags</i>		<i>With Ki lags and quarterly dummies</i>	
	Coef	t	Coef	t	Coef	t
LogIK	0,038	0,45	-0,004	-0,04	0,292	2,66
LogIK_1			-0,016	-0,14	-0,073	-0,64
LogIK_2			0,661	5,71	0,022	0,19
LogIK_3			-0,407	-3,66	0,015	0,14
LogIK_4			-0,215	-2,15	-0,051	-0,51
Ocup	0,952	4,1	0,876	2,98	0,424	1,51
Temp	0,260	1,85	0,168	1,14	0,175	1,34
Asalar_noc	0,190	1,63	0,246	1,93	0,310	2,67
Inmig	-0,058	-2,49	-0,025	-0,93	-0,016	-0,64
2nd Quarter					0,064	3,24
3rd Quarter					0,233	9,96
4th Quarter					0,042	2,06
Constant	-4,914	-5,5	-4,264	-3,91	-2,191	-2,32
P	0,362		0,355		0,413	
σ_η	0,884		0,819		0,453	
σ_ε	0,173		0,171		0,150	

In sum, we can conclude that, according to these results, there is no evidence of any negative effect of minimum wage on youth employment for the period 2000-2008. There are, however, some indications of a slightly positive or neutral effect, a result which is consistent with other research on the subject (Card, 1995; Manning and Machin, 1996; Dickens et al., 1998, 1999; Bhaskar, 1999; Lang and Kahn, 1999).

In the light of these results, we can ask ourselves if it is a valid hypothesis to assume that, in the case of young people, we are dealing with a monopsonistic type of labour market¹². Although the greater or lesser degree of realism of our assumptions is not the best methodological criteria for the selection and assessment of any model or theory, such monopsony power does not appear to be the prevailing factor due to the high level of atomisation and dispersion in labour demand that currently exists in Spain. Even so, it can always be counter-argued that the source of power for the employers primarily derives from the intrinsic limitations experienced by workers when choosing a

¹² See section 3 above where we indicate that for a monopsonist the increase of youth (minimum) wages tends to be accompanied by employment growth as the average cost for the employer is below the marginal cost. For an explanation of monopsony on the labour market see Elliot, 1991.

job and that, in the particular case of young workers, their lower level of qualification as well as their lack of working experience constitute an important obstacle in the search for employment.

This will imply that young people are more inclined to accept any wage level offered to them (“wage-conformist”) than the rest of the workers. Such affirmation could, in theory, be extended to other groups of workers, including those which belong to so called “outsider” collectives when having to negotiate collective bargain agreements. Furthermore, the existence of a dual labour market in Spain, closely linked to the type of labour regulation and the existing collective bargain structure, results in a sharp division between permanent and temporal workers, a relatively unbalanced situation when compared to other core European countries. For this reason, the co-existence of increases on both minimum wage and youth employment during this period can be deemed to be compatible with a competitive model characterised by a dynamic behaviour and structural change in labour demand, which also registers increases of its elasticity in relation to low-level wages. That is to say, a model where the institutional aspects (trade-union power and regulations) works as effective mechanisms to prevent an “emptying” of the labour marker, a situation towards which the free and unrestrained interplay of offer and supply might eventually lead to¹³.

In fact, there are a series of reasons which help us to explain both the absence of any negative impact on youth employment and the lack of any increase in the youth unemployment rate during the period under study. In the first place, the Spanish economy has experienced during this period a rapid economic growth –the average growth of the GDP has fluctuated between the 3 and 4 %, well above the average for the EU15- which has resulted in continuous shifts in labour demand to respond to new requirements in the productive and service sectors.

At the same time, there has been a significant increase in labour supply as a result of the large and steady inflow of immigrants (with high labour participation rates) as well as the continuous growth of women’s activity rate among the native population.

¹³ This last statement leads to the examination of the causes for this situation and to express certain reservations about the efficiency and “Paretian” symmetry degree of the current labour regulation mechanisms and labour relations prevailing in Spain.

Recent social changes in the country and the modification of labour legislation for better compatibility between family and labour life have both played an important role in the latter case.

These two developments have been the driving force behind the significant employment growth experienced during the period which has affected to all different working-age groups. All of them, including young people, have experienced several points increases in their respective employment rates. What this means, in theoretical terms, is that the market balance wage has reached a new threshold as a result of the steady increase of the demand (more specifically, by the shift of the demand function) and of its elasticity.

The availability of an almost unlimited labour offer has eliminated most of the previous labour force restrictions which slowed down the production growth, especially in the construction and service sectors. Several sectors have experienced significant structural changes both in terms of an intensified use of the labour factor per production unit and of important changes in the occupational structure. As a result of these changes, the number of low-qualifications or skilled jobs have doubled during the period under study. In addition to this, we also have to include the reinforcement of the elasticity of wage labour demand in relation to the GDP.

Despite the increase of labour demand, but also as result of the expansion of labour offer, the average behaviour of wages – and of minimum wage - has registered a slight fall in real terms. Such fall has not been the result of any wage reduction in high or medium qualification occupations, but rather of the fall of the wages of an important percentage of new workers employed in low-qualifications jobs. That is to say, this fall in wages is, in short, due to the increasing degree of wage dispersion.

6. The Minimum Inter-professional Wage (SMI) in the new economic context.

Table 7 shows a series of different scenarios (proposed, respectively, by the trade unions and the Spanish government) including deadlines, new expected wage

levels as well as percentage increases in monetary terms that such proposed scenarios will imply in the near future.

In the case of *Scenario A* (government proposal) the minimum wage increase for the period 2009-2012 is an accumulated 33.33% (an average simple annual increase of 8%) Under the *Scenario B*, this increase is close to 66.66% for the same period with an annual rate of 16.66%. This larger increase of 66.6% is also considered in the case of *Scenario C* (proposed by Socialist Party), but it is extended to the period 2009-2016, with a simple average increase of 8.33%. Finally, if the objectives of the European Social Chart are to be met as in the proposed *Scenario D*, the minimum wage increase will amount to 85.18%. While in this proposal there is no reference to any specific time period, if we presume this to be identical to previous scenarios, this will represent a 10.64% increase of minimum wage. In all these cases, the increases will be above the expected accumulated inflation of the reference period, which will imply a significant increase of the Minimum Inter-professional Wage (SMI) in real terms.

Table 7: Economic and labour market evolution. Future SMI scenarios		
EVOLUTION AND SCENARIOS	EVOLUTION (INDEX) OR CURRENT VALUE	MONTHLY FIGURE
1. GDP Evolution, Active, Employed, and Unemployed Population: 1996-2007	150,5	
• GDP (real)	128,3	
• Active population	158,0	
• Employed population	50,3	
• Unemployed population	115,2	
• Activity rate	135,9	
• Employment rate	37,6	
• Unemployment rate		
2. Wage evolution and SMI values		
A) Wage evolution		
• Real average wage:1998-2004	92,8	
• Real SMI:1998-2004	96,9	
• Nominal SMI in 1998	408,9	
• Nominal SMI in 2004	460,5	
• Nominal SMI evolution 1998-2004	112,6	
B) Wage evolution		
• Real average wage: 2005-2007	101,8	
• Real SMI: 2005-2008	106,0	
• Nominal SMI in 2005	513,0	
• Nominal SMI in 2008	600,0	
• Nominal SMI evolution SMI 2005-2008	117,0	
3. SMI proposed scenarios (in current €) :		
• Government's scenario A (2009-12)	133,33 %	800 €
• Trade Unions' scenario B (2009-12)	166,66 %	1.000 €
• PSOE's scenario C (2009-16)	166,66 %	1.000 €
• European Social Chart's scenario D (no dates)	185,18 %	(*) 1.111,1 €
(*) Percentage equivalent to 60% of EU net medium wage.		

Source: Own elaboration from the available data in the report: "Efectos en el empleo de las subidas del Salario Mínimo Interprofesional en España y en la Comunidad de Madrid" (Consejería de Empleo y Mujer, Comunidad de Madrid).

Regarding these different proposals, the first consideration that has to be made is that their attainment will take place on a period of economic slow down which, among other things, will result in a severe adjustment of the labour market in depth and over time. This recent, dramatic change in the economic activity trend implies a substantial modification of the framework where we can place the potential effect of wages on labour demand. In this context, it will be difficult to expect that any cost increase in the labour factor would remain neutral: in the following years, we are likely to see a drawback in labour demand, a loss in the elasticity of low-wage sections, as well as changes in the labour time organization.

For all these reasons, the minimum wage policies should be administered with great caution. In the light of the current literature about theoretical predictions and the accumulated empirical evidence for industrialised countries, including this present work in the case of Spain, we can tentatively elaborate the following list of the possible consequences of these developments:

i) Negative effects on employment with an accumulative character and distributed over time due to the existence of lags. This will imply a gradual reduction in the overall employment rate, especially among those workers who are more exposed to become redundant in such circumstances like, for example, young people, women, disabled persons, low-skilled persons and, in general, all low-pay workers.

ii) An eventual expansion of part-time, rather than full-time, employment as part of employers' strategy to make working time more flexible, reduce labour costs, and increase productivity.

iii) An increase of the unemployment rate, longer unemployment periods, and the rise of long-term unemployment.

iv) A displacement from the labour market of those collectives whose new wages appear now to be closer to the average market wage and replacement by other worker with wages above average but with a reduced wage cost for employers.

v) An early exit from the education system with an increase in labour participation rate. In the medium term, participation rates fall gradually due to the disincentive effect as these high school drop-outs have little job opportunities and tend to reduce the number of worked hours (part-time employment)

vi) A reduction in the intensive use of labour force in activities or occupational groups characterised by low skilled tasks, just the opposite phenomenon to what have happened few years ago.

vii) Substantial increases of irregular employment, especially among immigrants, as they belong to a large employment supply group for low-skilled jobs and are particularly exposed to the black economy. This phenomenon is likely to be more marked at regional level, wherever the gap between the minimum and average wages becomes closer.

7. Conclusions.

This work has examined the impact of minimum wage on youth employment in Spain using the available data for the period 2000-2008. For this purpose, we have developed an analytical framework capable of taking into account regional differences, the existence of lag effects, and the seasonal character of youth employment.

In order to capture the effects which various un-observed labour supply and demand factors may have on the youth employment rate, we have followed the existing literature on the subject and decided to use in our analysis the Kaitz Index defined here as the quotient of the minimum wage per worked hour for full-time workers of a particular region and the average wage per worked hour. Furthermore, we have also proposed a alternative definition of the Kaitz Index to deal with the possibility of finding important wage variations between different sectors.

The results obtained show, first of all, that the introduction or increase of the minimum wage may have lagged effects on employment. Although it appears that the minimum wage has, in fact, a positive and significant effect on youth employment, this

effect is no longer clear once we include in our estimates the KI quarterly lags. More specifically, there are positive and significant effects in the first and second lags, but a negative and significant effect on the third lag.

Furthermore, youth employment in Spain has a marked seasonal character. For this reason, it is particularly relevant to take this feature into account when analysing the impact of minimum wage on youth employment. Once we take into account the seasonality of employment, the negative impact observed in the KI third lag becomes, accordingly, no-significant

In conclusion, then, if we consider existing regional differences, the lags and the seasonal work variations, there is no definitive evidence of any negative effects of minimum wage on youth employment in Spain in the period under study. While this result can be interpreted as evidence of the existence of a monopsonistic labour market, it can also be compatible with a perfect competitive structure where a certain dynamic factor and a structural change in labour demand coexist together.

References.

- Bhaskar, V. (1999). "Minimum Wages for Ronald McDonald Monopsonies: A Theory of Monopsonistic Competition", *Economic Journal*, Vol 109, 455. 190-203.
- Brown, C., Gilroy, C. and A. Cohen (1982). "The Effect of the Minimum Wage on Employment and Unemployment". *Journal of Economic Literature*, Vol. XX, 487-528.
- Card, A., and A.B.Krueger (1995), *Myth and Measurement: The New Economics of the Minimum Wage*, Princeton, N.J., Princeton University Press.
- Currie, J. and B. Fallick (1996). "The Minimum Wage and the Employment of Youth: Evidence from the NLSY". *UCLA Working Paper*.
- Deere, D., Murphy, K. and F. Welch (1995). "Reexamining Methods of Estimating Minimum-Wage Effects". *AEA Papers and Proceedings*, Vol 85, May, . 232-237.
- Dolado, J.J, Kramartz, F., Machin, F., Manning, A., and C.Teulings (1996). "The Economic Impact of Minimum Wages in Europe", *Economic Policy*, 23, 317-372.
- Dolado, J.J, Felgueroso, F., and J.F. Jimeno (1997). "Employment Effects of Minimum Wage Laws. The effects of minimum bargained wages on earnings: Evidence from Spain". *European Economic Review*, 41, 713-721
- Dolado, J.J and F. Felgueroso (1997). "Los efectos del salario mínimo: evidencia empírica para el caso español", *Moneda y Crédito*, 204, 213-263.
- Dolado, J.J, Felgueroso, F., and J.F. Jimeno (1999). Los problemas del mercado de trabajo juvenil en España: empleo, formación y salarios mínimos". *Ekonomiaz*, vol. 43, 136-157.
- Elliot, R.F (1991).Labor Economics. McGraw-Hill, London, Part 4, Chapter 10..
- González Güemes, I. (1997). "Los Efectos del Salario Mínimo sobre el Empleo de Adolescentes, Jóvenes y Mujeres: Evidencia Empírica para el Caso Español", *Cuadernos Económicos del ICE*, Vol 63, pps. 31-48.
- González, Güemes, I., Jiménez, S., and C. Pérez (2003). "Los efectos del salario mínimo sobre el empleo juvenil en España: nueva evidencia". *Revista Asturiana de Economía*, 27.
- Hashimoto, M., and J. Mincer (1970), "Employment and Unemployment Effects of Minimum Wages", NBER, WP, Cambridge
- ILO (2008). Working Conditions Laws 2006-2008, Geneve
- Katz, L.F., and A.B. Krueger (1992). "The effect of the minimum wage on the fast-food industry". *Industrial and Labour Relations Review*, 46, 6-21

- Lang, K., and S. Kahn (1999). "The Effect Minimum Wage Laws on the Distribution of Employment: Theory and Evidence", *Journal of Public Economics*, Vol 69, 1, 67-82.
- Linneman, P. (1980). "The Economic Impacts of Minimum Wage Laws: A New Look at an Old Question". WP 14. Center for the Study of the Economy and the State, University of Chicago.
- Machin, S., and A.Mannig (1996). "Employment and the introduction of a minimum wage in Britain", *The Economic Journal*, 106, pp 667-676.
- Machin, S., and A.Mannig (1999), "The Effects of Minimum Wages on Employment: Theory and Evidence from Britain". *Journal of Labor Economics*, vol. 17, no 1, 1-22.
- MTI (2008). Ministerio de Trabajo e Inmigración. Guía Laboral y de Asuntos Sociales, Capítulo IV., Madrid, April 2008.
- Neumark, D., and W. Wascher (1992). "Evidence on employment effects of minimum wages and subminimum wage provisions from panel data on state minimum wage Laws". NBER, WP 3859.
- Neumark, D., and W. Wascher (2002), "State-Level Estimates of Minimum Wage Effects. New Evidence and Interpretations from Disequilibrium Methods", *The Journal of Human Resources*, 35-62.
- Neumark, D., Schweitzer, M., and W. Wascher (2004). "Minimum Wage Effects throughout the Wage Distribution". *The Journal of Human Resources*, XXXIX. 2.
- Neumark, D., and W. Wascher (2005), "The Effects of Minimum Wages on the Distribution of Family Income". *The Journal of Human Resources*, XL.4. 867-894.
- OCDE (1994). The OCDE Jobs Study. Evidence and Explanations, pp.46 y ss.
- Partridge, M., and J. Partridge (1998). "Are Teen Unemployment Rates Influenced by State Minimum Wage Laws?", *Growth and Change*, vol. 29, 4, pp 359-382.
- Pereira, S.C. (2003). "The impact of minimum wages on youth employment in Portugal". *European Economic Review*, 47, 229-244.
- Pérez Domínguez, C. (1995). "Los Efectos del Salario Mínimo sobre el Empleo y el Desempleo: Evidencia Empírica para España", *Actas de las I Jornadas de Economía Laboral*, Alcalá de Henares, Madrid.
- Pérez Domínguez, C., González Güemes, I., and M^a D. Praga (2002). "Los Efectos Simultáneos del Salario Mínimo sobre el Empleo, la Participación y la Tasa de Paro de los Adolescentes", *Moneda y Crédito*, 215, pps. 225-246.

- Rebitzer, J.B., and L.J.Taylor (1995), "The consequences of minimum wage laws. Some new theoretical ideas", *Journal of Public Economics*, 56, pp 245-255.
- Welch, F. (1974). "Minimum Wages Legislation in the United States", *Economic Inquiry*, Vol 12, 3, pps, 285-318.
- Wellington, A.J. (1991), "Effects of the Minimum Wage on the Employment Status of Youths", *The Journal of Human Resources*, June, 27-46.
- Williams, N., and J. Mills (1998). "Minimum Wages Effects by Gender", *Journal of Labour Research*, Vol 19, 2, 397-414.
- Yuen, T. (2003). "The Effect of Minimum Wages on Youth Employment in Canada". *The Journal of Human Resources*, XXXVIII.3, pp 647-672.

Annex.

Block I: Evolution of the KI by sector of activity and region



